NOTES FOR A STATEMENT

BY

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TO THE

STANDING COMMITTEE ON NATIONAL RESOURCES

AND PUBLIC WORKS

APRIL 3, 1973 3:30 P.M.

Mr. Chairman and committee members,

This is the first of the presentations of Departmental and Agencies estimates for which I am responsible to Parliament. To-day I would like to introduce those of Atomic Energy of Canada Limited and also of the Atomic Energy Control Board. These I think can provide a frame work for discussion of the questions of nuclear energy, its possibilities and problems, in Canada.

ATOMIC ENERGY OF CANADA LIMITED

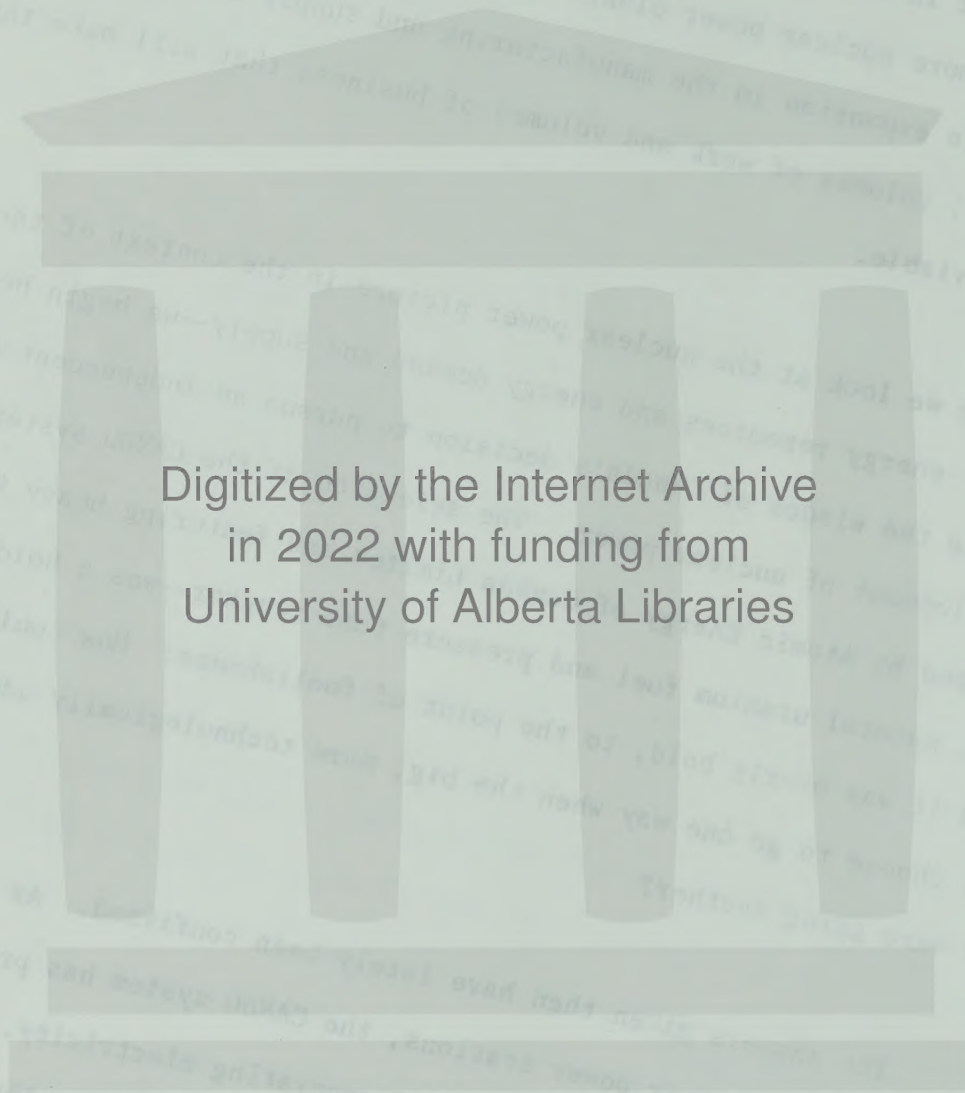
In the energy scheme of things, nuclear power occupies a place of increasing importance, and in this area Atomic Energy of Canada Limited has played, and will continue to play, a major role.

Ten years ago, nuclear power capacity in Canada was a mere 22,000 kilowatts. Today it is nearly one hundred times that figure, over 2 million kilowatts. By 1982 we estimate nuclear power plants will be producing some 7 million kilowatts of electricity and the forecast is that in the decade after that, the output will jump to more than 30 million kilowatts. Assuming the forecast is reasonably accurate, this means Canada in a 30-year period will have acquired a nuclear generating capacity equal to the total electric power capacity, hydraulic and thermal, installed in this country up to the year 1960.

As most of the nuclear plants that will be supplying those millions of kilowatts have yet to be built, it is evident that a very considerable expansion of effort in the nuclear power field is not far ahead of us. Not only will we see more nuclear power plants built more frequently, but there will be comparable expansion in the manufacturing and supply sectors of the nuclear industry; volumes of work and volumes of business that will make that industry truly viable.

When we look at the nuclear power picture in the context of the total energy scene--energy resources and energy demand and supply--we begin better to appreciate the wisdom of Canada's decision to pursue an independent course in the development of nuclear power. The selection of the CANDU system--originated and developed by Atomic Energy of Canada Limited and featuring heavy water moderator, natural uranium fuel and pressure tube reactor--was a bold venture. Some said it was overly bold, to the point of foolishness: How could Canada possibly choose to go one way when the big, more technologically advanced nations were going another?

The answers given then have lately been confirmed. As exemplified in the Pickering nuclear power stations, the CANDU system has proven itself to be a reliable and efficient means of generating electricity. Similarly, it has been shown that we have in Canada all of the engineering capability required for the design, management and operation of large nuclear power projects and in our industry the capability to provide most of the hardware and materials required for nuclear installations.



Of special significance to us are the fuel economy and security of fuel supply that come from the use of the CANDU system. To produce a given amount of energy, CANDU reactors require only half as much uranium, taken from the ground, as other current systems. A corollary is that their fuelling costs are appreciably lower. And because we use natural uranium fuel and have in Canada large resources of uranium, we are completely self-sufficient in respect to nuclear fuel supply.

Referring again to Pickering, I would like to give you some interesting statistics and comparisons. When I spoke to this committee last year, I reported that in December 1971 Pickering had produced more power than any other nuclear station in the world. In December 1972 Pickering did it again. December's output was 1,092,236,000 kilowatt hours, highest ever for Pickering besides being highest in the world.

January proved to be even better--1,191,555,000 kilowatt hours. In a month of high demand, the station's three operating units made a remarkable contribution to Ontario's energy supply. Although Pickering constitutes only about 10 per cent of the province's installed capacity, in January it provided more than 18 per cent of Ontario's power.

We have cause to be proud, and to boast, of Pickering's performance. But we must remember that it is our first large commercial station, is but the bottom rung of a ladder whose height we can only vaguely perceive. We have a foot firmly on that bottom rung, but if we are going to climb the ladder we

must ensure that Pickering continues to perform well, that the experience gained is applied to the CANDU stations that follow and that full advantage is taken of the forward-looking work being done in AECL's research and development laboratories. In providing support for the present nuclear power system, in all its aspects, and in developing ways of realizing the future potential of that system, AECL's people are going to be fully occupied.

Special, concerted attention is being given to heavy water production processes. As members of the committee are aware, there is a shortage of heavy water at the present time and it is likely to persist for at least another year. With the object of reducing the demand-supply gap, major effort is being made by AECL and industry to overcome problems and improve performance in the present heavy water production plants.

At the same time, work is under way on the development of advanced processes that might be introduced in futre heavy water plants. In this regard, AECL and Polymer Corporation Limited last year signed an agreement under which Polymer will build and operate experimental facilities to test new methods of heavy water prodcution developed at AECL's Chalk River laboratories.

Je ferais mal mon devoir, si je ne parlais pas d'un autre aspect des réalisations de l'Énergie atomique du Canada Limitée, (l'EACL); il s'agit des travaux effectués dans les domaines de la radiation et de l'application des radioisotopes. Depuis longtemps, l'Énergie atomique du Canada Limitée est à l'avant-garde dans la mise en pratique et la production d'appareils

thérapeutiques au cobalt-60, appareils qui sont utilisés dans le traitement du cancer. Jusqu'à maintenant, plus de 1,000 de ces appareils ont été expédiés dans 62 pays, à travers le monde. Et cette année, la société a expédié les premiers nouveaux appareils au cobalt-60, qui offrent des avantages jamais vus auparavant, tant à l'Énergie atomique du Canada Limitée que chez ses compétiteurs des autres pays.

Il est intéressant de constater que lors de l'Exposition commerciale de Pékin, l'année dernière, l'EACL a reçu des demandes d'achats d'instruments thérapeutiques d'une valeur d'environ $250,000; récemment, la République populaire de Chine faisait une autre série de demandes d'achats, d'une valeur aussi substantielle.

Parmi les autres appareils commerciaux de radiation qui ont été développés, mentionnons les accélérateurs médicaux pour le traitement du cancer; les appareils de stérilisation au cobalt-60, pour stériliser les instruments chirurgicaux utilisés dans les salles d'opération; on a également développé des appareils d'activation des analyses de neutrons ainsi que de petites génératrices actionnées aux radioisotopes.

Atomic Energy of Canada Limited has been notified by Argentine authorities that a 600-megawatt CANDU station offered by AECL and its Italian partner, Italimpianti, has been chosen for Argentina's next nuclear power plant.

The principals, AECL-Italimpianti and the Argentine Atomic Energy Commission, will now begin negotiations with a view to signing a formal contract. This could take some weeks.

According to information received by AECL, the Argentine Junta decided in favor of a reactor fuelled with natural uranium for the nuclear power plant to be built at Rio Tercero in the Province of Cordoba, about 500 miles west of Buenos Aires. Implementing the decision, the Argentine Atomic Energy Commission chose the heavy water moderated, natural uranium fuelled CANDU reactor offered by AECL-Italimpianti.

The partnership calls for AECL to supply the nuclear portion of the plant and Italimpianti the conventional part.

The price is in the order of $220 million. It does not include customer costs, such as escalation and interest during construction. Canadian input is estimated at about $100 million.

The Canadian Government has approved Export Development Corporation financing for the Canadian portion of the project. Details will be settled during contract negotiations.

Other bidders were General Electric and Westinghouse of the United States and Kraftwerk-Union of Germany.

The AECL-Italimpianti offer provides for a construction period of 59 months from the date the contract is signed.

ATOMIC ENERGY CONTROL BOARD

Votes 25 and 30 relate to the estimates of the Atomic Energy Control Board which was established by the Atomic Energy Control Act in 1946 to control dealings in Canada in atomic energy materials and equipment and to enable Canada to participate effectively in any international measures for control of atomic energy.

The basic objectives of the Board's program, which is unchanged from previous years, are:

1) to control the health and safety and the national security aspects of atomic energy materials and equipment through administration of the Atomic Energy Control Act and Regulations;

2) to provide grants for atomic energy research and for the education and training of persons in the atomic energy field.

For 1973-74, estimates have been submitted to cover the operating expenditures for the Board's operation as well as the grants program and the statutory contributions. Operating expenses cover the salaries of and costs related to the Board's staff (estimated to increase to 57 persons by 31 March 1974) and advisory committees (approximately 10 Committees). The grants program includes continuation of funding for research work to eleven Canadian universities and capital funding of the TRIUMF facility. Statutory Contributions include contributions to superannuation accounts.

ADMINISTRATION OF THE ATOMIC ENERGY CONTROL REGULATIONS

(a) Health and Safety

The acquisition, use and disposal of atomic energy materials and equipment are controlled by a comprehensive licensing system in the interests of radiation health and safety. In addition to the technical expertise on its own staff, the Board makes use wherever possible of advice and inspection services already available through the federal and provincial departments, particularly those of Health and Labour. The Board has on its staff specialist officers in the fields of reactor safety, accelerator safety, transportation of radioactive materials, operations involving enriched uranium or plutonium, radioisotope equipment, uranium mining and milling, and radioactive waste management.

A formal licensing system for nuclear reactors was established in 1957. In the licensing and inspection fields, special mention should be made of the work of the Board specialist staff and of the two specialist advisory committees (the Reactor Safety Advisory Committee and the Reactor Operator Examination Committee) in a continuing safety review and inspection of the following research and power reactor installations

1) the McMaster Nuclear Reactor
2) the University of Toronto Sub-critical Facility
3) the University of Toronto SLOWPOKE Research Reactor
4) the NPD (Nuclear Power Development) Generating Station
5) the Douglas Point Generating Station
6) the Gentilly Nuclear Power Station
7) the Pickering Generating Station (Units 1, 2, and 3),

all of which are in operation, and of the design and construction of the Pickering Generating Station (Unit 4), and the Bruce Generating Station (Units 1 to 4).

To ensure the safe operation of particle accelerators which are now being established in increasing numbers in Canada for research, industrial and medical purposes, the Board in 1970 established a licensing system for such facilities. Board specialist officers in this field are assisted by the Board's Accelerator Safety Advisory Committee.

In the field of safety in the transportation of radioactive materials, the Board is acting as the regulatory authority controlling shipments of radioactive materials by road pending the active participation of designated federal and provincial authorities in controlling shipments of dangerous goods by this mode of transport. In addition, the Board provides technical advice on shipment of radioactive materials to the three federal regulatory authorities responsible for controlling shipments of dangerous goods by rail, sea and air.

In matters of radiation safety associated with the production and use of radioactive materials, the Board seeks advice from the federal and provincial health departments. Board technical specialists review the safety of operations involving the use of enriched uranium or plutonium to ensure that no criticality accidents will occur. Board officers also review design and operation of large scale irradiator facilities and other radioisotope devices such as radioisotope powered cardiac pacemakers.

Board officers, in cooperation with advisory committees and other relevant federal and provincial government departments, are also active in the radiation health and safety aspects of uranium mining and milling and of radioactive waste management.

b) Security

The Board licenses the acquisition, production and use of strategic atomic energy materials and carries out inspection of Canadian atomic energy facilities to ensure that these materials are not diverted to other than peaceful uses. In previous years, the Board also conducted inspections of Canadian-supplied atomic energy materials in other countries to check that these materials were being used for peaceful purposes only in accordance with announced Canadian government policy. As a result of Canada's ratification of the Non-Proliferation Treaty, these overseas inspections will be gradually taken over by safeguards inspectors of the International Atomic Energy Agency but the experience gained by Board inspectors is of considerable assistance to this international inspectorate. At the present time, a Board safeguards officer is serving as an Agency safeguards inspector.

A safeguards development program in cooperation with the U.S. Arms Control and Disarmament Agency, the United States Atomic Energy Commission and Atomic Energy of Canada Limited to develop tamper-resistant, tamper-indicating, unattended inspection instrumentation was started at the NPD Generating Station and is being continued at the Pickering Generating Station. The development of suitable instrumentation of this type could reduce considerably the number of inspectors required to safeguard the strategic materials in the Canadian type of nuclear power reactor. Most of the capital expenditures in Vote 25 will be required for this development program.

OCTROIS POUR RECHERCHES SUR L'ÉNERGIE ATOMIQUE

La Commission de contrôle de l'énergie atomique accorde des octrois aux universités canadiennes afin de leur permettre l'achat et l' usage des principales pièces d'équipement pour l'énergie atomique, ainsi que l'établissement de programmes de recherches sur l'énergie atomique. La Commission conclut également des ententes permettant des études relatives aux mesures de santé et de sécurité à prendre lors de travaux effectués à l'aide d'équipement et de matériel d'énergie atomique. La résolution n° 30 a pour effet la prolongation de ces octrois et ententes avec quelque 11 universités canadiennes ainsi qu'avec le projet TRIUMP (Tri-University Meson Facility), qui représente l'université de la Colombie-Britannique, l'université Simon Fraser, l'université de Victoria et l'université de l'Alberta. Ce dernier projet comprend la conception et la construction d'un cyclotron de forme spirale, d'une capacité de 500 millions d'électrons-volts, ainsi que les usages subséquents qu'on lui fera faire, comme outil de recherche pour le développement intermédiaire de la physique énergétique nucléaire. Du montant total approuvé selon la résolution n° 30, soit quelque 7 millions 245 mille dollars, une somme de 4 millions 650 mille dollars est destinée au projet TRIUMF.

Un comité mixte de la Commission de l'énergie atomique du Canada et du Conseil national de recherches fait des recommandations à ses deux principaux organismes de financement afin qu'ils apportent tout l'appui monétaire nécessaire aux principales installations nucléaires ainsi qu'aux programmes de recherches dans les universités canadiennes. Ce même comité mixte visite périodiquement les universités concernées afin de vérifier l'équipement qu'on y a installé et les travaux effectués à l'aide des octrois de la Commission de l'énergie atomique du Canada.